

## NOTES

THE meeting of the French Association for the Advancement of Science will take place this year at Rouen on the 16th inst.; extensive preparations are being made for the reception of the members. The electric light is to be a prominent feature of the meeting, owing to the project entertained by the municipality of lighting part of the city by the motive power of the Seine at Pont de l'Arche, as we mentioned in a recent note.

THE Lords of the Committee of Council on Education have sanctioned the addition of Hygiene to the list of sciences towards instruction in which aid is afforded by the Science and Art Department. The following is the syllabus of the subject:—**Elementary stage:** (1) food, diet, and cooking; (2) water and beverages; (3) air; (4) removal of waste and impurities; (5) shelter and warming; (6) local conditions; (7) personal hygiene; (8) treatment of slight wounds and accidents. **Advanced stage:** (1) food and adulterations; (2) water and beverages; (3) examination of air—chemical and microscopical; (4) removal of waste and impurities; (5) shelter and warming; (6) local conditions; (7) personal hygiene; (8) prevention of disease. **Honours:**—In addition to the topics enumerated under the elementary and advanced stages, questions will be set in the following subjects: trades nuisances, vital statistics, sanitary law.

THE new portion of the University of Indiana, at Bloomington, in that State, was set on fire by lightning during a thunderstorm on the night of July 12, the electricity travelling along a telephone wire which served the institution. The laboratory, museum, and library were completely destroyed. The museum contained a collection of fishes, made by Dr. Jordan, which was thought to be the largest and most valuable in the United States. There were 15,000 volumes in the library, besides the so-called Owen collection, the loss of which is believed to be irreparable. The general loss is estimated at \$200,000, of which only \$30,000 is covered by insurance.

THE U.S. bureau of education has, we learn from *Science*, just published a circular of information, containing the results of an inquiry into the effects of co-educating the sexes in 340 cities and large towns of the Union. Of these, 321 practise co-education throughout the public-school course, 17 co-educate for part of the course, and 2 separate the sexes entirely. A careful analysis of the reasons adduced for co-education enables the editor to formulate them as follows: co-education of the sexes is preferred where practised, because it is (1) *natural*, following the usual structure of the family and of society; (2) *customary*, or in harmony with the habits and sentiments of every-day life and law; (3) *impartial*, affording to both sexes equal opportunities for culture; (4) *economical*, using school funds to the best advantage; (5) *convenient* both to superintendent and teachers in assigning, grading, instruction, and discipline; and (6) *beneficial* to the minds, morals, habits, and development of the pupils. The pamphlet concludes by observing that “both the general instruction of girls, and the common employment of women as public-school teachers depend, to a very great degree, on the prevalence of co-education, and that a general discontinuance of it would entail either much increased expense for additional buildings and teachers, or a withdrawal of educational privileges from the future women and mothers of the nation.”

IN an article entitled “Cholera and Our Water-Supply,” in the current number of the *Nineteenth Century*, Dr. Percy F. Frankland draws attention to the vital connection between water-supply and the diffusion of zymotic disease. He points out how, in consequence of the terrible epidemics of Asiatic cholera to which the metropolis has been subjected in the past, the companies supplying London with water from the Thames

have been obliged to remove their intakes to a distance which shall insure the freedom of their supply from contamination with the London sewage, and thus at any rate to put an end to their former practice of “rapidly restoring to the inhabitants of London the drainage matters which the sewers had discharged.” But although the Thames at Hampton is free from this source of pollution, yet it is similarly fouled, although in a less degree, with the sewage of a population estimated at upwards of half a million which enters the river above the intakes of the water companies. In extenuation of this obviously revolting state of things, many theories have been started: of these the most popular and fallacious is that which, under the title of “the self-purification of river-water,” announces that noxious organic matters present in river-water are rapidly destroyed in the course of a few miles’ flow. This doctrine, unsupported as it is by any facts or accurate observations, is wholly dogmatic and in complete opposition to all previous knowledge concerning the properties of organic substances in general. The late Rivers Pollution Commissioners, moreover, conclusively proved that water once polluted with sewage is only very slowly purified, and more recent research shows the great tenacity of life possessed by the lower organisms which are believed to be allied to those capable of communicating zymotic disease. Chemical analysis further proves that the Thames water reaches the intakes of the London Water Companies with a but slightly diminished proportion of organic matters. In the face of the now well known fact that London possesses within easy reach water of the purest quality and abundant in quantity, it is inexcusable that such manifestly impure sources should still be resorted to. Hitherto only one of the eight metropolitan water companies has entirely abandoned the polluted rivers and substituted them by the pure water obtained from deep wells sunk into the chalk. London should follow the example of other large towns in Great Britain; thus Glasgow now drinks the waters of Loch Katrine, Manchester is bringing a supply from Cumberland, whilst London, with water of the best quality much nearer at hand, is still compelled to drink the waters of the Thames and Lea.

THREE addresses will be delivered at Annonay by members of the Academy of Sciences on the occasion of the forthcoming inauguration of the Montgolfier statue. M. Dupuis de Lome will speak on the general history of ballooning; M. Tisserand, in the name of the Paris Observatory, on the scientific prospects of ballooning; and Col. Perrier, the representative of the President of the Republic, on the results of ballooning in warfare. M. Laussedat, the director of the Conservatoire des Arts, who was the first director of Meudon Châlet Aéronautical Establishment, will speak on the career of the brothers Montgolfier. The aéronautical ascents will be made with a Montgolfier by Eugène Godard, and with a gas balloon by M. Brissonet, fils, of Paris. We believe that M. Tisserand will recommend the use of balloons for certain astronomical observations.

THE Trustees of the Australian Museum (Sydney) have issued their twenty-ninth Annual Report for 1882. The increasing importance of the Australian Museum, and the growing interest of the public in it, are shown by the remarkable increase of 18,446 visitors during the past year; the attendance being 81,596 on weekdays as against 73,995 in 1881, and 52,505 on Sundays as against 41,660 in 1881, the increase on weekdays being upwards of 14 per cent., and on Sundays upwards of 26 per cent. Application has been made to the Government to consider the necessity of enlarging the Museum buildings. More room is urgently required, not only for purposes of exhibition, but for the office staff and workmen. A catalogue of Australian stalk- and sessile-eyed Crustacea, prepared by Mr. Wm. A. Haswell, M.A., B.Sc., has been printed and distributed extensively among various museums and natural history societies; and the work of

cataloguing the whole of the Museum collections is being pushed forward as rapidly as possible. The most serious loss ever sustained by the Museum has occurred through the recent destruction of the Garden Palace—the large and varied collection of technological and ethnological specimens sent there for exhibition having been totally destroyed by the fire which consumed the building. The Technological Committee lost no time in commencing a new collection; and, having already obtained many ethnological specimens of great interest, they are taking steps to secure as many others as possible. This is a work which admits of no delay, as genuine ethnological examples from the islands are becoming scarcer every day, in consequence of the general spread of trade and civilisation through the whole of Polynesia. Suitable accommodation for the display of the technological and ethnological specimens already in hand should at once, if possible, be provided. The most important work carried on by the Trustees during the year has been the exploration of the caves and rivers of Australia. It was continued until the close of December at the Wellington Caves, where the bones of an immense Echidna and of a large Struthian bird allied to the Emu, as well as some smaller animals of less note, hitherto unknown to science, have been discovered and added to the Museum. Numerous other fossil bones valuable for exchanges with foreign museums have been obtained. The exploration of rivers was conducted by the assistant taxidermist in Queensland, where strong hopes of discovering some new Ganoid fishes were entertained. A special report of this work, with a list of the specimens procured, is given in appendices.

THE Clothworkers' Company have agreed to give a donation of 10,000*l.* for the enlargement of the Textile and Industrial Department of the Yorkshire College at Leeds. Altogether the Clothworkers' Company have given upwards of 25,000*l.* towards this institution.

THE Ornithological Society of Vienna wishes to call the attention of English ornithologists to the International Congress of Ornithologists which will be held next spring at Vienna in connection with the annual exhibition of the Ornithological Society of Vienna, under the protection of H.I.H. the Crown Prince Archduke Rudolf of Austria. The chief business of the Congress will be to pass preliminary resolutions for international legislation regarding the protection of birds. The Austrian Government will send out invitations to the different foreign Governments, and will grant a free passage to Vienna to the representative of each foreign Government. All those interested in the above subject should apply for further information to Dr. Gustavus von Hayek, Hon. First Secretary of the Ornithological Society of Vienna, 3, Marokkaner Gasse, Vienna.

THE following list of candidates successful in the competition for the Whitworth Scholarships, 1883, has been issued by the Science and Art Department:—James Hamilton, Engineer, 200*l.*; William E. Dalby, Engineer Apprentice, 150*l.*; John L. Barnes, Engineer Apprentice, 150*l.*; Thomas K. Mackenzie, Student, formerly Mechanical Engineer, 150*l.*; William Sumner, Fitter, 150*l.*; Frank W. Dodd, Engineer Apprentice, 150*l.*; Charles N. Pickworth, Mechanical Engineer, 150*l.*; Henry E. Kitton, Mechanical Engineer, 150*l.*; James Layzell, Engineer Apprentice, 150*l.*; Horace W. Meteyard, Engineer, 100*l.*; Alfred S. Ormsby, Mechanic, 100*l.*; William P. Abell, Mechanical Engineer, 100*l.*; Alfred W. Bevis, Tutor, formerly Engineer Apprentice, 100*l.*; John W. Aston, Engineer Apprentice, 100*l.*; Alfred E. Mackett, Marine Engine Fitter, 100*l.*; Victor F. Whitehead, Engineer, 100*l.*; Charles Lang, Pattern Maker, 100*l.*; James Bradshaw, Mechanical Engineer, 100*l.*; Alfred J. Joshua, Fitter, 100*l.*; William A. Rogerson, Fitter, 100*l.*; William E. Donohue, Draughtsman (Marine), 100*l.*;

Albert H. Case, Engineer, 100*l.*; Alexander Shannon, Engineer, 100*l.*; Mark R. Bullimore, Fitter, 100*l.*; John S. Bean, Engineering Draughtsman, 100*l.*

THE biennial marine excursion of the Birmingham Natural History and Microscopical Society, which took place at Oban in July last, and lasted for ten days, was on the whole most successful. It was attended by twenty-three members of the Society. A superior screw steam yacht, the *Aërolite*, was chartered for the occasion, and the weather being very fine, dredging was carried on daily at various stations which were all recorded on a chart at depths which varied from fifteen to one hundred fathoms. The principal object of this excursion was to secure further specimens of the *Pennatulida*, a few only of which were taken in the dredgings at the same place during 1881. These formed the subject of a special report made to the Society last year by Prof. Marshall, D.Sc., and Mr. W. P. Marshall, M.I.C.E., and for which the Darwin Gold Medal, given by the Midland Union of Natural History Societies was awarded at the Tamworth meeting held in June last. Some special instruments made of galvanised iron and armed with hooks were devised by Mr. W. P. Marshall for the occasion, called the "plough" and the "harrow." These, together with the dredges and trawl, were for the first time on these excursions worked by means of steam gear. A small dredge measuring a few inches was used by hand for testing the nature of the bottom of the sea, and all these various appliances worked admirably. A large number of specimens of *Funiculina quadrangularis* and *Pennatula phosphorea* in various stages of growth were secured in fine condition and unbroken. A number of specimens of Sponges, Zoophytes (including a rare free form of *Zoanthus conchii*, var. *liber*, Gosse), Echinoderms, Crustaceans, Annelids, Tunicates, Mollusca, &c., were also secured. These were exhibited and described to the members during the days and in the evenings by Mr. W. R. Hughes, F.L.S., chairman of the excursion, Mr. W. P. Marshall and Mr. J. F. Goode, Hon. Sec. of the Biological Section, who have also made a preliminary report thereon to a recent meeting of the Society. During the excursion phosphorescence was for the first time observed in *Funiculina*, the characteristic pale blue light coruscating over the whole series of polypes, the length of the specimen being between three and four feet, and presenting a very beautiful effect when viewed in the dark. In addition to the dredging, some attention was paid to the botany and geology of the district by several of the members. During a walk on July 1 fifty species of plants were gathered in flower. A collection of specimens of the rocks of Oban and the vicinity, including Staffa, Iona, Mull, Glencoe, Easdale, &c., was also made for future examination.

THE city of Geneva intends to utilise the current of the Rhone for lighting the whole of the city. A report on the question is being drawn up, which will be submitted to the Council of State.

A PRELIMINARY meeting of the members of the future Société des Électriciens took place at the Ministry of Posts and Telegraphs. M. Cochéry was present, but he declined to preside over the proceedings, and the honour was bestowed upon M. Berger.

AN electrical omnibus was recently tried on the Cour de Carrousel, Paris, before M. Cochéry to prove the facility with which this sort of carriage is handled in spite of its immense weight. The trial, which took place in the busiest hours of the day, attracted much notice from the passers-by, and was generally deemed satisfactory.

THE *Italia del Popolo*, in one of its latest numbers, gives the names of a number of localities from which birds and insects have disappeared just before invasions of cholera.

THE death is announced, at the age of 83, of Linant Pasha (Linant de Bellefons), one of the leading personages connected



with the existing Suez Canal. Under Said Pasha he was appointed head of the Ponts et Chaussées department, and chief engineer of the Suez Canal project. In early life he travelled much in Abyssinia, Kordofan, and Darfur.

SIR CLAUDE DE CRESPIGNY, in company with Mr. Simmons, made a successful balloon voyage from Maldon in Essex across the North Sea to Flushing on Wednesday last week. The start was made at 11 a.m., and Flushing was reached about 8 p.m. The highest altitude reached was 17,000 feet.

WAUSCHAFF of Berlin has lately made a piece of apparatus for registering earth currents. It consists of a very delicate galvanometer inclosed in a case with a clockwork arrangement for moving a photographic plate steadily downwards. A fine ray of light is reflected on to the galvanometer mirror by a total reflection prism and is focused on the photographic plate. The speed of the movement of the plate is 80 mm. per hour, thus allowing variations from minute to minute to be observed.

MM. LELANDE AND CHAPERON have brought out a new battery of very remarkable properties. The battery is a single liquid cell and has a depolarising electrode of oxide of copper, the liquid used is caustic potash, and the other pole is zinc. The battery is made in various forms, its E.M.F. is nearly 1 volt, whilst it is said to give a steady current through even a low resistance for many hours. Finally it is claimed for this battery that when exhausted it can be restored by driving a current from an accumulator through it.

A NEW edition (the fifth) is announced of the "Dictionnaire des Arts et Manufactures et de l'Agriculture," edited by M. Ch. Laboulaye.

MR. BROWNE asks us to say that in his recent article on Glacier Motion, p. 235, by a slip of the pen he stated that the sides of a glacier move faster than the middle, whereas, as every one knows, the reverse is the case.

THE additions to the Zoological Society's Gardens during the past week include a Grivet Monkey (*Cercopithecus griseo-viridis* ♂) from West Africa, presented by Lord Hastings; two Black-backed Jackals (*Canis mesomelas*), two Triangular Pigeons (*Columba guinea*) from South Africa, presented by Mr. R. Southey; two Indian Brush-tailed Porcupines (*Atherura fasciculata*) from Ceylon, presented by Mr. A. Dent; three Puffins (*Fratercula arctica*), British, presented by Mr. H. Becher; a Common Cormorant (*Phalacrocorax carbo*), British, presented by Mr. W. R. Temple; a Common Barn Owl (*Strix flammea*), British, presented by Mr. H. Hanaeur; a Common Wombat (*Phascolomys wombat* ♂) from Tasmania, a Common Cormorant (*Phalacrocorax carbo*), British, a Common Boa (*Boa constrictor*) from West Indies, deposited; a White Stork (*Ciconia alba*), two Common Spoonbills (*Platalea leucorodia*), two Purple Herons (*Ardea purpurea*), European, purchased; a Musk Deer (*Moschus moschiferus* ♂) from Central Asia, received on approval; a Collared Fruit Bat (*Cynonycteris collaris*), two Amherst's Pheasants (*Thaumalea amherstiae*), two Summer Ducks (*Aix sponsa*), bred in the Gardens.

#### A CONTRIBUTION TO THE STUDY OF THE TRANSMISSION EASTWARDS ROUND THE GLOBE OF BAROMETRIC ABNORMAL MOVEMENTS

IN his paper on "Abnormal Variations of Barometric Pressure in the Tropics, and their Relation to Sun-spots, Rainfall, and Famines," published in NATURE (vol. xxiii. pp. 88 and 107), Mr. Fred. Chambers pointed out, when treating of the barometric records of the stations, St. Helena, Mauritius, Bombay, Madras, Calcutta, Batavia, and Zi-ka-wei, that abnormal movements which had occurred at a westward station—e.g. Mauritius—reappeared at an eastern station—e.g. Bombay—some time later,

and then again at a further eastern station, Madras, still later, and so on, until they finally reached the most distant station eastwards. It appeared therefore that there were abnormal movements of the atmospheric pressure which travelled from west to east; the rate of travel seemed to vary at different times; and Mr. Chambers summed up his results in the following words:—"It appears then that these atmospheric waves (if such they may be called) travel at a very slow and variable rate round the earth from west to east like the cyclones of extra-tropical latitudes."

In his "Brief Sketch of the Meteorology of the Bombay Presidency in 1880," Mr. Chambers proceeded to test the validity of his conclusions by applying them to an examination of the barometric records of Zanzibar for that year and a portion of the next as compared with the records of Belgaum for the same period; and he again noticed that "there was much similarity in the abnormal movements of barometric pressure at Zanzibar and Belgaum, although these stations are about 2500 miles apart, but that the Belgaum curve lagged decidedly from two to three months behind the Zanzibar curve."

This discovery, if substantiated, would obviously prove of great practical value, inasmuch as it would make it possible to obtain a forecast of the barometric movements about to occur at any particular station by watching the movements already taking place at a point westward of that station. And as definite variations in the atmospheric pressure may be, and in some cases are known to be, accompanied by definite variations in the other meteorological elements, a method of weather prediction would thus be furnished.

It has fallen to my lot to receive and discuss the Zanzibar observations succeeding those last discussed by Mr. Chambers; and the results obtained by my examination of them seem to involve matters of some practical and theoretical interest.

TABLE I.—Monthly Abnormal Barometric Pressure at Zanzibar, Belgaum, and Bombay

Months.	Monthly Abnormals (unsmoothed).			Monthly Abnormals (smoothed).		
	Zanzibar	Belgaum	Bombay	Zanzibar	Belgaum	Bombay
February 1880	-.014	-.024	.000	—	—	—
March "	-.005	-.013	-.020	-.004	-.017	-.011
April "	+.008	-.022	-.006	+.003	-.022	-.010
May "	+.005	-.032	-.008	+.006	-.023	-.002
June "	+.008	-.008	+.015	+.018	-.009	+.014
July "	+.054	+.011	+.035	+.034	+.007	+.031
August "	+.022	+.015	+.041	+.034	+.010	+.030
September "	+.038	-.001	+.006	+.035	+.007	+.017
October "	+.044	+.015	+.019	+.038	+.008	+.013
November "	+.026	+.003	+.010	+.031	+.014	+.019
December "	+.028	+.037	+.040	+.025	+.015	+.029
January 1881	+.018	+.026	+.029	+.019	+.027	+.033
February "	+.014	+.022	+.037	+.009	+.019	+.033
March "	-.007	+.008	+.032	+.005	+.007	+.030
April "	+.023	-.008	+.020	+.005	-.005	+.018
May "	-.017	-.013	+.001	+.003	-.007	+.017
June "	+.024	+.005	+.049	+.013	+.002	+.031
July "	+.025	+.013	+.028	+.019	-.003	+.022
August "	+.003	-.046	-.016	+.017	-.020	.000
September "	+.037	-.004	+.005	+.021	-.017	.000
October "	+.009	-.014	+.004	+.002	-.020	-.006
November "	-.047	-.051	-.037	-.024	-.035	-.023
December "	-.014	-.028	-.024	-.015	-.020	-.010
January 1882	+.012	+.026	+.029	-.005	+.001	+.014
February "	-.033	-.017	+.010	-.016	-.003	+.014
March "	-.012	-.003	+.011	-.011	-.015	+.004
April "	+.012	-.040	-.016	.000	-.026	-.002
May "	-.009	-.024	+.011	+.002	-.026	+.001
June "	+.017	-.018	-.002	+.016	-.023	-.003
July "	+.040	-.034	-.019	+.031	-.025	-.005
August "	+.029	-.014	+.020	+.027	-.019	+.004
September "	+.012	-.015	-.002	—	—	—

From these observations the variations from the normal monthly barometric movements have been obtained. They are tabulated in Table I., and are represented graphically by the